

A CHECK LIST ON DISTRIBUTION OF ORNAMENTAL FISHES IN CHILIKA LAGOON, EAST COAST OF INDIA

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Abstract: Chilika Lagoon in the Odisha Coast of India is one of the World's unique biodiversity hot spot having international importance. It is the largest brackish water lagoon with estuarine character having its socioeconomic importance. The present study highlights on diversity of ornamental fish from four sector of Chilika lagoon namely Southern, Central, Northern and outer. A total number of 20 species representing 12 families of class Actinopterygii were identified from four sector of Chilika Lagoon. The order Perciformes having highest occurrence inside the lagoon followed by order Cypriniformes, Siluriformes, Tetraodontiformes and Osteoglossiforms. During study period it was observed that highest number ornamental fishes were found in Northern sector and central sector. These ornamental fishes have high economic value if it is collected and maintained in aquarium then it will help the local fisher folk for their lively hood and development of their family.

Keywords: East Coast, Chilika lagoon, Ornamental fishes

Öz: **Hindistan' nın Doğu Kıyısı Chilika Lagünü'ndeki Süs Balıklarının Dağılımının Kontrol Listesi**

Dünyanın eşsiz biyoçeşitlilik sıcak noktası olan Chilika lagünü uluslararası bir öneme sahiptir. Burası dünyanın en büyük sosyoekonomik öneme sahip haliç karakterindeki acısu lagünüdür. Bu mevcut çalışma Chilika lagününün güney, merkez, kuzey ve dış olarak adlandırılan dört bölgesindeki süs balıklarının çeşitliliğini ortaya koymaktadır. Chilika lagününün dört bölgesinden Actinopterygii sınıfındaki 12 familyayı temsil eden toplam 20 tür tespit edilmiştir. Lagün içinde en fazla gözlenen takım Perciformes olup bunu Cypriniformes, Siluriformes, Tetraodontiformes ve Osteoglossiforms takımları takip etmiştir. Çalışma dönemi boyunca en fazla sayıda süs balığı kuzey ve merkez bölümde gözlenmiştir. Bu süs balıkları yüksek ekonomik değere sahiptir eğer bu balıklar toplanır ve akvaryum içinde muhafaza edilirse yerel balıkçı halkın yaşam alanlarının ve ailelerinin gelişmesine yardımcı olacaktır.

Anahtar Kelimeler: Doğu Kıyısı, Chilika lagünü, Süs balıkları

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Introduction

Ornamental fishes are characterized by a wide diversity of color pattern which is keeping in aquaria to relive pressure on daytoday materialistic life. The ornamental fish keeping is a popular hobby which is gradually replacing outdoor leisure activities and it is the second most hobby after photography Sing and Dey (2006). According to psychiatrists, placing aquaria with ornamental fishes in the patient's vicinity could treat certain type of mental disorders Swain (2008). The marine ornamental fish trade has a significant role in the economy of developed and developing countries both as a foreign exchange earner and as a source of employment. The world ornamental fish trade is about 4.5 billion US \$ while India's contribution through export is only about 0.5 million US \$. The United States of America alone imports ornamental fishes worth more than 500 million US \$. In Holland, 20% of the houses maintain ornamental fishes, 14 % in UK, 8 % in USA, 5 % in Germany and 4 % in Belgium and Italy Sakthivel (2002). Asia is the major exporting region accounting for 56% of the global exports. India has joined the lead 10 Asian exporting countries recently, contributing only 2% of the Asian export Kutty (2008). According to information available in Global Marine Aquarium data set a total of 1,471 species of marine ornamental fishes are traded around the globe. Most of the species are associated with coral reefs. About 400 species of Ornamental fishes belong to 175 genera and 50 families are reported in Indian water but this figure is on rise as more numbers of survey are made in different location of the country Satheesh, (2002). The brackish waters are home to an amazingly diverse and unique group of fishes, some of which are commonly available to keep in the home aquarium so in this juncture the Chilika Lagoon is the burning example for the occurrences of number of ornamental fishes in sector wise distribution. A number of surveys have been made for the estimation of ichthyofaunal diversity in Lagoonecosystem ZSI (1995), Jhingran and Natarajan (1966), CDA (2004), Mohanty et al., (2007) Mohanty et al., (2006)but till now no research work has been attempted related to the diversity of ornamental fish resources of the lagoon. Therefore the present study is an attempt to make a checklist on occurrences of or-

namental fishes in Chilika Lagoon and their distribution.

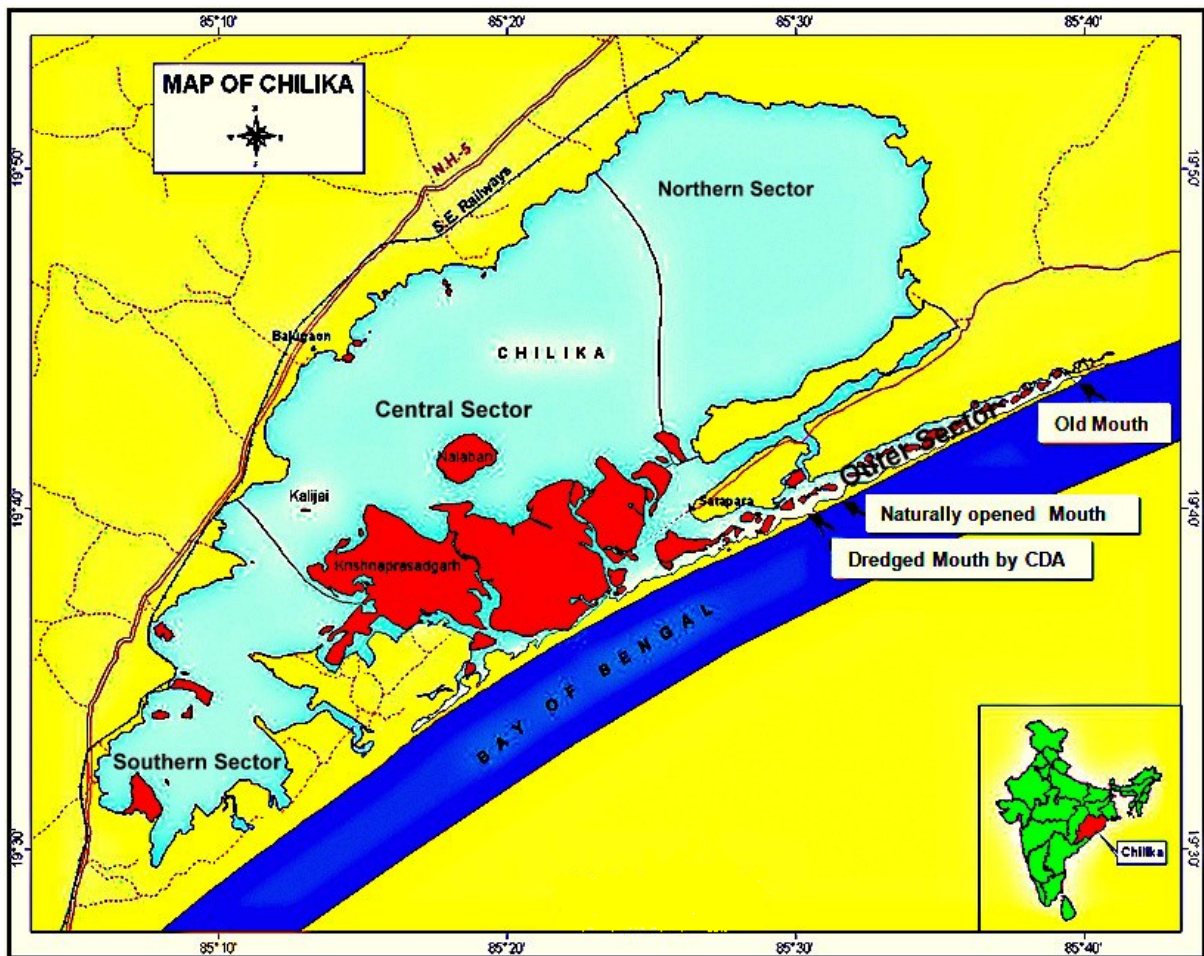
Materials and Methods

Study Area

Chilika is the largest pear shaped brackish water lagoon of Asia with captivating beauty, abundant biological resources and rich economic attributes and known for its rich source of fish supply. It is situated in latitude 19°28'–19°54'N and longitude 85°06'–85°36'E. The water-spread area of the Chilika Lagoon varies from 1165 to 906 km² during the monsoon and summer respectively Siddiqui and Rao, (1995). A significant part of the freshwater and silt input to the lagoon comes from the Mahanadi river and its distributaries Mohanty et al., (1996). Based on its physical and dynamic characteristics, the lagoon is divided into four sectors (Fig.1). The northern sector receives discharge of the flood waters from the rivers. The southern sector is relatively smaller and does not show much seasonal variation in salinity. The central sector has features intermediate between the features of the other sectors. The outer sector of the lagoon comprises of a 24-km narrow and curved channel that runs parallel to the coast to join the Bay of Bengal near Arakhakuda It stretched over three districts namely Puri, Khurda and Ganjam. It is separated from the Bay of Bengal by a barrier spit attached at its southern end (Venkataratnam, 1970). It is one of the hot spot of biodiversity in the country and inhabiting a number of endangered species listed in the IUCN Red list of threatened species (World Bank, 2005).

Methodology

The ornamental fishes are collected by the help of dugout canoes or boat seines. The gears are bag nets, scoopnets and cast nets from the different sector (Table 1). The collected fishes were kept in a bucket with battery operated aerator and transported to the laboratory. They are initially acclimatized to the tank environment. The healthy fishes were transferred to the marine research aquarium for further studies. The fishes were identified by using standard literature Talwar et al., (1992), Talwar and Jhingran, (1991), Fish Base (2003).

Figure 1. Map showing Study areas.**Table 1.** Sampling site and total number of Marine ornamental fish recorded Chilika Lagoon

Sampling site	Habitat	Cordinates	Number Species
Southern sector	Marine	85.161, 19.586	Nil
Central sector	Brackish and Marine	85.318, 19.719	7
Northern	Fresh water	85.483, 19.805	13
Outer Sector	Marine	85.549, 19.692	1

Results and Discussion

A total number of 20 species were recorded during the study period from the Chilika Lagoon. The order Perciformes has emerge as most dominant group and next to order Cypriniformes among these diverse coloured fish community. The maximum numbers were recorded during pre-monsoon, monsoon and post-monsoon around northern sector of the lagoon. Among fishes species 13 species are fresh water in origin and rest 7 species are brackish and marine in nature (Table 2, Figure 2-21).

Notopterus notopterus (Pallas,1796)

Notopterus (Figure 2) is a fresh water fish, which was caught from Northern sector of the lagoon. It is commonly known as Asian knife fish, Ghost knife fish and Bronze feather back. It measured about 18.0 cm in length and 21.0 g in weight. It is very aggressive towards its own species and timid towards other larger fishes. It is a nocturnal sps. It requires a very large well planted aquarium (Aquatic Community, 2009). It is dist-

ributed in Southeast Asia. Bangladesh, Cambodia, India, Burma, Nepal, Pakistan, Thailand and Vietnam.

Labeo calbasu (Hamilton,1822)

Labeo calbasu (Figure 3) is a fresh water fish, which was caught from Northern sector of Chilika. It is commonly known as orange fin labeo. It measured about 32.0 cm and 42.6 g in weight. It is a potamodromous species (Talwar and Jhingran, 1991). It occurs in rivers and Ponds of India. It is distributed in Asia, India, Bangladesh, Nepal, Thailand, Myanmar and South Western China.

Labeo boga (Hamilton,1822)

Labeo boga (Figure 4) is a fresh water fish, caught from northern sector of the lagoon. It is commonly known as Red gilled violet shark. It measured about 35.0 cm and 45.3 g weight. It also occurs in small rivers and ponds (Aquatic Community, 2009). It is found in Asia. Pakistan, Nepal, India and China.

Table 2. Checklist of Ornamental fishes existing in four different sector of Chilika Lagoon

Species	Family	Order	Class	SC	CS	NS	OS
<i>Notopterus notopterus</i>	Notopteride	Osteoglossiforms	Actinopterygii	-	-	†	-
<i>Labeo calbasu</i>	Cyprinidae	Cypriniformes	Actinopterygii	-	-	†	-
<i>Labeo boga</i>	Cyprinidae	Cypriniformes	Actinopterygii	-	-	†	-
<i>Chela cachius</i>	Cyprinidae	Cypriniformes	Actinopterygii	-	†	†	-
<i>Nandus nandus</i>	Nandidae	Perciformes	Actinopterygii	-	†	†	-
<i>Puntius sophore</i>	Cyprinidae	Cypriniformes	Actinopterygii	-	-	†	-
<i>Mystus gulio</i>	Bagridae	Siluriformes	Actinopterygii	-	†	-	-
<i>Mystus vittatus</i>	Bagridae	Siluriformes	Actinopterygii	-	†	-	-
<i>Chelonodon patoca</i>	Tetraodontidae	Tetraodontiformes	Actinopterygii	-	-	-	†
<i>Scatophagus argus</i>	Scatophagidae	Perciformes	Actinopterygii	-	-	†	-
<i>Pseudambassis ranga</i>	Ambassidae	Perciformes	Actinopterygii	-	-	†	-
<i>Ophiocephalus gachua</i>	Channidae	Perciformes	Actinopterygii	-	-	†	-
<i>Ophiocephalus punctatus</i>	Channidae	Perciformes	Actinopterygii	-	-	†	-
<i>Therapon jarbua</i>	Theraponidae	Tetraodontiformes	Actinopterygii	-	-	†	-
<i>Puntius chola</i>	Cyprinidae	Cypriniformes	Actinopterygii	-	-	†	-
<i>Oreochromis mossambis</i>	Cichlidae	Perciformes	Actinopterygii	-	-	†	-
<i>Siganus javus</i>	Siganidae	Perciformes	Actinopterygii	-	†	-	-
<i>Etroplus suratensis</i>	Cichlidae	Perciformes	Actinopterygii	-	†	-	-
<i>Dantnoide squadrifasciatus</i>	Datnioididae	Perciformes	Actinopterygii	-	†	-	-
<i>Plotosus arab</i>	Plotosidae	Siluriformes	Actinopterygii	-	†	-	-

SC-Southern Sector, CS-Central Sector, NS-Northern Sector, OS-Outer Sector

***Chela cachius* (Hamilton,1822)**

Chela cachius (Figure 5) is commonly known as Silver hatchet. It is a benthopelagic in habit. It is found both in northern sector and central sector of Chilika Lagoon. It is also found in rivers and ponds. It occurs both fresh and brackish water. It measures 7.3 cm length and weighed about 12.0 g. though its common name is Silver hatchet, the species seemingly a plain silver fish when viewed in sun light. It helps far mosquito control (Mennon, 1999). It is distributed in India, Pakistan and Bangladesh.

***Nandus nandus* (Hamilton,1822)**

Nandus nandus (Figure 6) is commonly known as gangetic leaf fish. It is a high prized fish of its spinous fins and ugly black bands and blotches on the body. It is found most commonly in standing or sluggish waters of lagoon. It is also found in reservoirs and canals (Talwar and Jhingran, 1991). It is a benthopelagic in origin both found in northern and central sector of Chilika lagoon. The fish measured 10.0 cm in total length and weighed 15.6 g. It is found in Pakistan, Thailand and India (Talwar and Jhingran, 1991).

***Puntius sophore* (Hamilton,1822)**

Puntius sophore (Figure 7) is commonly known as pool barb. It is a fresh water fish which caught from northern sector of the lagoon. The spotted barbs are present in the body. The size of the species is 7 cm in total length and weighed about 13.2 g. It is found in Eastern India, Kerala, Sri Lanka and Nepal (Aquatic Community, 2009).

***Mystus gulio* (Hamilton,1822)**

It is commonly known as mangrove cat fish (Figure 8). The species caught from central sector. It lives in both fresh and brackish water. It is easily differentiated from the other species by the combination of its greyish silver colour and small adipose fins. In aquarium the species always swims above the bottom and feeds by olfactory sense rather than sites (Pethiyagoda, 1991). The size of the species is 8 cm in length and contains 11.0 g in weight. It is found in India, Indonesia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand and Vietnam.

***Mystus vittatus* (Bloch)**

It is commonly known as striped dwarf cat fish (Figure 9). It caught from central sector. Its size is 12 cm in length and 15.8 g in weight. It can live both in fresh and brackish water. It is a demersal fish. Colour varies with age. It is generally delicate grey silver to shining golden with several pale blue or dark brown to deep black longitudinal on side. A narrow dusky spot often present on the shoulder (Pethiyagoda, 1991). It is distributed through Indian subcontinent area including Pakistan, India, Sri Lanka, Nepal and Bangladesh.

***Chelonodon patoca* (Hamilton,1822)**

It is commonly known as milk spotted puffer fish or gangetic puffer fish(Figure 10). It is a marine fish. It caught from outer channel. Many of the fishes inhabit brackish and fresh water. Its size is 19 cm in total length and weighed about 25.6 g. Many species are used in aquarium for decorating the room (Kottelat, 1993). It is distributed in tropical and subtropical areas of Atlantic, Indian and Pacific Ocean.

***Scatophagus argus* (Linnaeus)**

It is commonly known as scat or pavillon tach (Figure 11) . It is a freshwater fish which caught from northern side of the lagoon. The size of the species is 12.3 cm and weighed 18.0 g. It requires large aquarium, which is decorated in open places (Zipcode Zoo. Com). In aquarium it will eat anything, so called dung eater. It is found in Indo Pacific area, Japan, India and Fiji.

***Pseudambassis ranga* (Hamilton,1822)**

It is commonly known as glassfish or Indian glassfish (Figure 12). It is a fresh water fish which caught from northern sector of the lagoon. The size of the species is 10.5 cm and 15.0 g in weight. This species can be kept in small aquarium (Aquatic Community, 2009). It is distributed in Asia, Pakistan, India, Bangladesh and Thailand.

***Ophiocephalus gachua* (Hamilton,1822)**

It is commonly known as Asiatic Snake head (Figure 13). It is a freshwater species, which caught from northern sector of the lagoon. The size of the species is 12.7 cm and 21.3 gm in weight. It requires large aquarium, which is decorated in open places (Aquatic Community, 2009). It is very aggressive in nature. It is distributed in In-

dia, Southern part of China, eastern and western part of Pakistan.

***Ophiocephalus punctatus* (Bloch)**

It is commonly known as spotted snake head fish (Figure 14). It is a freshwater and caught from northern side of the lagoon. The size of the species is 12.0 cm and 19.8 g in weight. It requires large aquarium with slow circulation of air. It tolerates low oxygen concentration because they are air breathers from early age. Adult fishes may die due to lack of oxygen. It is distributed in rivers of India, Pakistan, Sri Lanka and Southern part of Nepal.

***Therapon jarbua* (Forsk.)**

It is commonly known as crescent Perch (Figure 15). It is found in coastal waters, mangroves and estuaries. It is found in rivers almost to fresh water. It is caught from northern sector of the lagoon. The size of the species is 18.5 cm and 25.6 g in weight. It may also found in marine and brackish water. In aquarium the juveniles are peaceful but active but as they mature become more solitary and aggressive and therefore less popular for aquaria. It is predatory in nature and also it will eat all the marine food from the aquarium. It is found in Japan, Western Pacific, South China sea, the Indian Ocean and the Red sea.

***Puntius chola* (Hamilton, 1822)**

It is commonly known as Swamp barb, chola barb (Figure 16). It is a freshwater fish which caught from northern sector of the lagoon. The size of the species is 6.7 cm in total length and weighed about 10.0 g. It occurs mainly in shallow waters (Talwar and Jhingran, 1991). It is found in Asia, Pakistan, Nepal, India, Bangladesh, Sri Lanka and Myanmar.

***Oreochromis mossambicus* (Peters)**

It is commonly known as Tilapia species (Figure 17). It is a freshwater origin also seen in rivers. The main colouration is yellow, though colouration is unreliable due to different feeding strategies (Popma, 1999). Tilapia species were released for the control of mosquitoes but failed to grow and stabilize mosquitoes populations and became a nuisance (Moyle, 1976). The size of the

species is 15.0 cm in length and 25.2 g in weight. It is found in India, Japan and Pakistan.

***Siganus javus* (Hamilton)**

It is commonly known as Rabbit fish (Figure 18). It is a marine fish which caught from central sector of the lagoon. The size of the species is 11.0 cm in total length and 18.7 g in weight. In aquarium it always swims in group. It also accommodates with the surgeon fishes in the marine reef aquaria. It mostly prefers vegetable feed (Aquatic Community, 2009). It is found in Bangladesh, Sri Lanka and India.

***Etroplus Suratensis* (Bloch)**

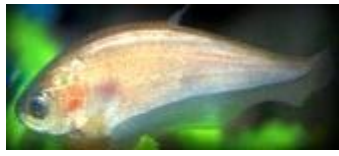
It is commonly known as Pearl spot found in brackish water but it known to tolerate fresh or marine water which caught from central sector (Figure 19). The size of the species 18 cm and 40 g weight. Feed on filamentous algae, plant material and insect. It is distributed in western Indian ocean, India and Srilanka (Fish base).

***Dantnoide squadrifasciatus* (Bleeker)**

It is commonly known as known as trigger fish found in brackish water of which is caught from central sector (Figure 20). The size of fish 60 cm in nature and 30 cm in captivity. The body color is gray white and the head may have an amber iridescence. The body is marked with seven black stripes. The first of these runs from the mouth to the eye where it forks with one part running to the back and the other toward the throat. The base of the caudal fin is marked with two black spots. The fins are transparent except for the pelvic fin which is white and black. It distributed in Asia and Australia; Borneo, Burma (Myanmar), Cambodia, the Ganges of India, Thailand and Sumatra (Fish base).

***Plotosus arab* (Bleeker)**

It is commonly known as cat fish found in marine and brackish water of outer and central sector (Figure 21). Body chestnut brown with 2 or 3 pale lateral bands, the superior one from above eyes along base of dorsal fin and the lower band from maxilla along middle of side of body. It is found in native to the Indian Ocean, the western Pacific Ocean and New Guinea.



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Figure 2-21. List of ornamental fish encounter in different sector of Chilika lagoon

Conclusion

Nature having a large number of ornamental fishes so a judicious exploitation of ornamental fishes from nature is required for sustainable development of the ornamental fishes. There is a warning for South-East Asian Countries, due to over exploitation of many fresh water ornamental fishes are endangered. Detailed studies on breeding, biology and behaviour aspects, nutrition and feed formulations, disease diagnosis and comprehensive health management is highly essential for the conservation and proper management of the ornamental fishes. These would make it possible to exploit the potentials of ornamental fish culture sector in the country to a greater extent in coming decades.

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